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Andrew S. Fuller
Motorola, Inc.
Law Department
8000 West Sunrise Boulevard
Fort Lauderdale, FL 33322

EXAMINER	
TALAPATRA, ANIKA F	
ART UNIT	**PAPER NUMBER**
2631	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/022,943	Applicant(s) GORDAY ET AL.	
	Examiner Anika F. Talapatra	Art Unit 2631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 12/18/2001.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-21 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-21 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 18 December 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 12/18/01,12/15/03.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 18 December 2001 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

2. Claim 4 objected to because of the following informalities: Claim 4 refers to "...said receiver further comprises..." where no receiver was previously mentioned in claim 4. This is incorrect. The phrase should be corrected to read, "...said transmitter further comprises..." Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action: A person shall be entitled to a patent unless –

> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-17, and 20-21 rejected under 35 U.S.C. 102(b) as being anticipated by Bar-David et al. (U.S. Patent 5623511) (hereafter referred to as Bar-David).

As to claim 1, Bar-David teaches a transmitter (figure 4) for generating a first, in-phase, (figure 4, I) and second, quadrature, (figure 4, Q) modulation signals in response to a first and second input data symbols, wherein the transmitter comprises: an inherent transmitter memory for storing a code sequence (figure 4, 410); a first time shifting means, determined by the first data symbol, coupled to the memory and generating a first encoded sequence (figure 4, 430, 420); and a second time shifting means, determined by the first data symbol, coupled to the memory and generating a second encoded sequence (figure 4, 430, 440) (column 7, line 18- column 8, lines 23; figure 4).

As to claim 2, Bar-David teaches that the transmitter further comprises a quadrature modulator, a modulator using two carriers out of phase by 90° and modulated by separate, in-phase and quadrature, signals (column 7, line 18- column 8, lines 23; figure 4, 455, 460, 465, $Acosw_{ct,}$ 470, $Asinw_{ct}$).

As to claim 3, Bar-David teaches that the transmitter further comprises a radio frequency signal generator for generating an in-phase and quadrature radio frequency signals (column 1, line 61- column 2, line 3; figure 4, 455, 480) including: a first multiplier (figure 4, 465) for multiplying the in-phase signal and the first modulation signal, A $cosw_{ct,}$ (figure 4, 460, A $cosw_{ct}$) to produce an in-phase signal component; a second multiplier (figure 4, 470) for multiplying the quadrature signal and the second modulation signal, A $sinw_{ct,}$ (figure 4, 460, A $sinw_{ct}$) to produce a quadrature signal component; and a summer (figure 4, 475) for summing the in-phase and quadrature signal components to produce an output signal (column 7, line 18- column 8, lines 23; figure 4).

As to claim 4, Bar-David teaches that the transmitter further comprises an encoder (figure 4, 410) for converting an input bit-stream (figure 4, 8 DATA BITS) into a first (figure 4, I_{pos}) and second (figure 4, Q_{pos}) input data symbols, and the transmitter further comprising a means for converting the first and second output data symbols into an output chip stream (figure 4, 455, 475) (column 7, line 18- column 8, lines 23).

As to claim 5, Bar-David teaches that the transmitter comprises an encoder (figure 4, 410) and spread spectrum code generators (figure 4, 420, 440). Bar-David inherently teaches a temporary memory for storing data sequences used by the encoder and the spread spectrum code generators, for example, the memory element may comprise a M-chip shift register for shifting the code sequence, in order for the input sequences I_{pos} and Q_{pos}, to be multiplied by the spread spectrum code sequence.

As to claim 6, Bar-David teaches that the transmitter further comprises a pulse-shaper, or modulator (figure 4, 455) for generating an in-phase and quadrature radio frequency signals including: a first multiplier (figure 4, 465) for multiplying the in-phase signal and the first modulation signal, A $\cos w_{ct}$, (figure 4, 460, A $\cos w_{ct}$) to produce a first in-phase modulated signal component; a second multiplier (figure 4, 470) for multiplying the quadrature signal and the second modulation signal, A $\sin w_{ct}$, (figure 4, 460, A $\sin w_{ct}$) to produce a second quadrature modulated signal component; and a summer (figure 4, 475) for summing the in-phase and quadrature signal components to produce an output signal (column 7, line 18- column 8, lines 23).

As to claim 7, Bar-David teaches a receiver for decoding a complex modulated signal, wherein the receiver comprises: an inherent receiver memory for storing a code sequence; a first correlator (figure 5, 540) coupled to the receiver memory for determining the correlation between a time-shifted version of the code sequence and the in-phase portion of the complex modulated signal; and a second correlator (figure 5, 540) coupled to the receiver memory for determining the correlation between a time-shifted version of the code sequence and the quadrature portion of the complex modulated signal (column 8, line 24- column 9, line 19; column 10, line 6- column 13, line 6; figures 5-6).

As to claim 8, Bar-David teaches that the receiver further comprises: a first and second spread spectrum code decorrelator, which produces a first and second correlation vales, for the in-phase and quadrature input signals, by multiplying the in-phase or quadrature signal with a code sequence stored at the

receiver (figure 5, 540, 545). These correlation values are then stored in 8 bit registers, where the largest or peak correlation value is identified (figure 5, 560, 565, 570) (column 8, line 24- column 9, line 19). Bar-David inherently teaches an M-chip shift register for storing and time-shifting an M-chip code sequence, and another M-chip complex register for storing the complex input signal. These registers are inherent; in order for the multiplication for correlation to be performed, the input signal and the stored code sequence must be placed in shift registers or other temporary storage units.

As to claim 9, Bar-David teaches that the receiver further comprises: first and second peak detectors, for detecting a peak in the first and second, in-phase and quadrature, respectively, correlation signals; and a means for recovering the output data symbols and storing them in an inherent receiver memory (column 9, lines 6-19; figure 5, 560, 565, 570, 8 BIT OUTPUT).

As to claim 10, Bar-David teaches that the receiver further comprises a quadrature down-converter, or demodulator (figure 5, 520, 525, 535), for converting the received signal into a complex modulated signal having real, in-phase, and imaginary, quadrature, components (column 8, line 24- column 9, line 19).

As to claim 11, Bar-David teaches a transmitter (figure 4) for generating a first, in-phase, (figure 4, I) and second, quadrature, (figure 4, Q) modulation signals in response to a first and second input data symbols, wherein the transmitter comprises: an inherent transmitter memory for storing a code sequence (figure 4, 410); a first time shifting means, determined by the first data symbol, coupled to the memory and generating a first encoded sequence (figure 4, 430, 420); and a second time shifting means, determined by the first data symbol, coupled to the memory and generating a second encoded sequence (figure 4, 430, 440) (column 7, line 18- column 8, lines 23; figure 4). Bar-David teaches a receiver for decoding a complex modulated signal, wherein the receiver comprises: an inherent receiver memory for storing a code sequence; a first correlator (figure 5, 540) coupled to the receiver memory for determining the

correlation between a time-shifted version of the code sequence and the in-phase portion of the complex modulated signal; and a second correlator (figure 5, 540) coupled to the receiver memory for determining the correlation between a time-shifted version of the code sequence and the quadrature portion of the complex modulated signal (column 8, line 24- column 9, line 19; column 10, line 6- column 13, line 6; figures 5-6).

As to claim 12, Bar-David teaches a transmitter (figure 4) for generating a first, in-phase, (figure 4, I) and second, quadrature, (figure 4, Q) modulation signals in response to a first and second input data symbols, wherein the transmitter comprises: an inherent transmitter memory for storing a code sequence (figure 4, 410); a first time shifting means, determined by the first data symbol, coupled to the memory and generating a first encoded sequence (figure 4, 430, 420); and a second time shifting means, determined by the first data symbol, coupled to the memory and generating a second encoded sequence (figure 4, 430, 440). Bar-David further teaches a first or second read direction, by generating the spread spectrum codeword in accordance with the calculated delay value, relative to the spread spectrum symbol interval center, in order to shift the main lobes of the I and Q signals appropriately, in order to convey the desired information (column 7, line 18- column 8, lines 23; figure 4).

As to claim 13, Bar-David teaches a receiver for decoding a complex modulated signal, wherein the receiver comprises: an inherent receiver memory for storing a code sequence; a first correlator (figure 5, 540) coupled to the receiver memory for determining the correlation between a time-shifted version of the code sequence and the in-phase portion of the complex modulated signal; and a second correlator (figure 5, 540) coupled to the receiver memory for determining the correlation between a time-shifted version of the code sequence and the quadrature portion of the complex modulated signal (column 8, line 24- column 9, line 19; column 10, line 6- column 13, line 6; figures 5-6). Bar-David further teaches that the receiver further comprises: first and second peak detectors, for detecting a peak in the first and second, in-phase and quadrature,

respectively, correlation signals; and a means for recovering the output data symbols and storing them in an inherent receiver memory (column 9, lines 6-19; figure 5, 560, 565, 570, 8 BIT OUTPUT). A memory or temporary memory is inherent for storing the spread spectrum code sequences, and for storing the input sequences and correlation values during the multiplication operation of correlation. This memory may have the form of an M-chip shift register or bi-directional register, depending on design choice.

As to claim 14, Bar-David teaches a transmitter (figure 4) for generating a first, in-phase, (figure 4, I) and second, quadrature, (figure 4, Q) modulation signals in response to a first and second input data symbols, wherein the transmitter comprises: an inherent transmitter memory for storing a code sequence (figure 4, 410); a first time shifting means, determined by the first data symbol, coupled to the memory and generating a first encoded sequence (figure 4, 430, 420); and a second time shifting means, determined by the first data symbol, coupled to the memory and generating a second encoded sequence (figure 4, 430, 440) (column 7, line 18- column 8, lines 23; figure 4). Bar-David teaches spread spectrum encoding, therefore it is inherent pseudo-noise codes are generated by the spread spectrum code generators (figure 4, 420, 440), as taught by Bar-David.

As to claim 15, Bar-David teaches that the transmitter further comprises a quadrature modulator, a modulator using two carriers out of phase by 90° and modulated by separate signals, thereby generating in-phase and quadrature modulated signals, which are then summed by a summer to produce a modulated signal (column 7, line 18- column 8, lines 23; figure 4, 455, 460, 465, $A\cos w_{ct,}$ 470, $A\sin w_{ct}$, 475).

As to claim 16, Bar-David teaches that the transmitter further comprises converting an input bit stream (figure 4, 8 DATA BITS, 410) into a first and second input data symbols (figure 4, $I_{pos,}$ Q_{pos}) (column 7, line 18- column 8, lines 23; figure 4).

As to claim 17, Bar-David teaches a receiver for decoding a complex modulated signal, wherein the receiver comprises: an inherent receiver memory for storing a code sequence; a first correlator (figure 5, 540) coupled to the receiver memory for determining the correlation between a time-shifted version of the code sequence and the in-phase portion of the complex modulated signal; and a second correlator (figure 5, 540) coupled to the receiver memory for determining the correlation between a time-shifted version of the code sequence and the quadrature portion of the complex modulated signal (column 8, line 24- column 9, line 19; column 10, line 6- column 13, line 6; figures 5-6). The correlation largest, or peak, values are determined (figure 5, 560, 565, 570), in order to determine the sign and position of the main and side lobes, and thereby determine the time shift between the first and second, in-phase and quadrature, received signal and the code sequence stored at the receiver (column 8, line 24- column 9, line 19; column 10, line 6- column 13, line 6; figures 5-6).

As to claim 20, Bar-David teaches that the receiver further comprises: a quadrature down-converter, or demodulator (figure 5, 520, 525, 535), for converting the received complex modulated signal into a real, or in-phase, signal, and an imaginary, or quadrature, signal (column 8, line 24- column 9, line 19).

As to claim 21, Bar-David teaches that the receiver further comprises: a spread spectrum code decorrelator for producing a first and second correlation between the in-phase and quadrature input signals and the spread spectrum code stored at the receiver (figure 5, 540, 545). As is inherent in spread spectrum systems, the spread spectrum code decorrelator may be implemented using a matched filter (column 8, line 24- column 9, line 19).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 18-19 rejected under 35 U.S.C. 103(a) as being unpatentable over Bar-David, further in view of Horne (U.S. Patent 6798825) (hereafter referred to as Horne.

As to claims 18 and 19, Bar-David teaches that the receiver claim 17 further comprises: performing vector multiplication of the stored spread spectrum code sequence with the first and second, in-phase and quadrature, input data signals to determine correlation values (Bar-David, column 8, line 24- column 9, line 19; figure 5). The memory elements for storing the spread spectrum code sequence and the modulated received signal may be M-chip shift registers. Bar-David does not the circular shift of the M-chip shift register used to store a pseudo-noise sequence for use is spread spectrum decoding. Horne teaches the use of circular spreading codes, which use circular shift registers, in spread spectrum systems (Horne, column 2, lines 50-59). It is well known in the art at the time of the invention that by using circular spreading codes, additional information is embedded in the rotated spreading code. Therefore, it would be obvious to one of ordinary skill in the art at the time of the invention, to use circular spreading codes, in the system taught by Bar-David, in order to embed additional information in the rotated spreading codes.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

i. U.S. Patent 6404804, Mannering et al. (column 7, lines 7-14); and

ii. U.S. Patent 6700922, Challa et al. (column 7, lines 14-30).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anika F. Talapatra whose telephone number is 571-272-6039. The examiner can normally be reached on Monday to Friday, 08:00-16:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammad Ghayour can be reached on 571-272-3021. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A.T.

KEVIN BURD
PRIMARY EXAMINER